subject matter which Applicants regard as the invention. As the Examiner shall ascertain, claims 1-4, 7, 9-11, 14-16, 18, 21-22, 24, 26 and 29 have been amended to overcome any outstanding informalities with reference to these claims.

With respect to claim 27, claim 26 (from which claim 27 depends) includes 20%, and not zero, of noble gas. Further, with respect to claims 22 and 23, "hPA" is a conventional unit of measure used in atmospheric pressure measurements. For at least these reasons, Applicants respectfully request that the 35 U.S.C. § 112, second paragraph rejection be withdrawn in light of the above remarks.

III. REJECTIONS UNDER 35 U.S.C. §§ 102 AND 103

Claims 30-31, 37 and 39 stand rejected under 35 U.S.C. § 102(b) as being unpatentable over Canadian Patent No. 2,244,248 by Hunger et al. Claims 1-3, 5-6, 8, 11, 13-29, 32-36 and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hunger et al. Claims 2, 5, 11, 13, 14 and 16-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hunger et al. as applied to claims 1-3, 5-6, 8, 11 and 13-39, and further in view of Canadian Patent No. 2,075,299 by Oppel et al.

In addition, claims 3, 15, 18-20, 24 26, 27, 29-32 and 39 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S Patent No. 3,677,799 by Hou. Claims 1, 2, 4-11, 13-16, 18-21, 24-29 and 33-34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hou. Claims 30-31 stand rejected 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,558,725 by Schnatbaum et al. Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hunger et al. or Hou as applied to

claims 2 or 5, and further in view of U.S. Patent No. 5,972436 by Walthers or U.S. Patent No. 5,286,534 by Kohler et al.

Claims 1 recites the steps of, *inter alia*:

> **determining an amount of at least one excited boron-releasing gas product in the glow discharge; and**
>
> **selecting production parameters of the plasma generated in the treatment chamber of the reactor so that a minimum and/or maximum value of the determined excited boron-releasing gas product and/or a minimum or maximum value of a relation of one or more of the determined excited boron-releasing gas products to another glow discharge product are maintained.**

At least these two recitations are not taught or suggested by Hunger et al. or Hou for at least the reasons presented below.

In particular, on page 4, first paragraph of the Examiner's Office Action, the Examiner admits that Hunger et al. does not teach or suggest "determining an amount of at least one excited boron-releasing gas product in the glow discharge," as recited in independent claim 1 of the above-identified application. Then, however, the Examiner alleges that it would have been obvious for one skilled in the art to perform such a determination (See Office Action page 4, line 2). Applicants respectfully assert that this allegation is simply not true. Indeed, Hunger et al. does not teach or suggest the step of "determining an amount of at least one excited boron-releasing gas product in the glow discharge," as explicitly recited in independent claim 1 of the above-identified application. In fact, such step would in no way be obvious to one of ordinary skill in the art.

By way of example, Hunger et al. utilizes a reaction mixture of three components, namely hydrogen, the noble gas argon and a boron trihalide. Hunger et al. uses a high volume content of argon, which is 40% to 45% by volume. In the examples described in Hunger et al., 15% to 10% by volume of boron trihalide is used in the mixture. In contrast, on page 6 of the specification of the present application, e.g., a certain gas mixture of the three components is described which can be quite different than these utilized in Hunger et al. In short, the teaching provided by Hunger et al. does not reach any conformity with respect to the components and percentages of the gaseous mixture. This is due to the inherent complexity of the mixture described in this application. Thus, it is unreasonable to believe that one of ordinary skill in the art could "determin[e] an amount of at least one excited boron-releasing gas product in the glow discharge," as recited in independent claim 1 of the above-identified application, or find it obvious to make such a determination. The Examiner's position in this regard is simply incorrect. It is also submitted that the step of "selecting production parameters of the plasma ..." is also not taught or suggested by Hunger et al.

With respect to Hou, this reference also does not teach or suggest the step of "determining an amount of at least one excited boron-releasing gas product in the glow discharge," as recited in independent claim 1 of the above-identified application. In fact, the Examiner does not contend that Hou contains such a teaching or suggestion, nor points to any section thereof for such teaching or suggestion. Thus, the rejection of independent claim 1 over Hou should also be withdrawn. Similarly, it is also asserted that the step of "selecting production parameters of the plasma ..." is also not taught or suggested by Hou.

For at least the same reasons presented above with respect to independent claim 1, since claims 2-29 depend from this claim, such claims 2-29 are also believed to be patentable over Hunger et al. and Hou. Further, none of the other references relied on by the Examiner for rejecting the claims of the present application cure the deficiencies stated above. Therefore, the Examiner is respectfully requested to withdraw the rejection to the pending claims.

Further, claims 30-39 have been canceled without prejudice merely to advance the prosecution of the present application. Therefore, any rejection of these claims is now moot, and should be withdrawn. Also, Applicants reserve the right to pursue the subject matter of any claim in its original, cancelled, or previously-amended form in this or any other application, including any continuation application herefrom.

IV. CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejections of the claims and to pass this application to issue.

Allowance of the application is solicited.

Respectfully submitted,

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Version With Markings To Show Changes Made

In the Claims:

Please cancel claims 30-39 and amend claims 1-4, 7, 9-11, 14-16, 18, 21-22, 24, 26 and 29 as follows:

1. (Amended) A method for producing a boride layer on a surface by plasma boronizing comprising:

~~supplying a gas mixture containing a boron-releasing gas to a treatment~~ chamber of a reactor;

generating a glow discharge in the reactor;

determining [the] an amount of at least one excited boron-releasing gas product in the glow discharge; and

selecting production parameters of the plasma generated in the treatment chamber of the reactor so [that] as to maintain at least one of: at least one of a minimum value and [/or] a maximum value of the determined excited boron-releasing gas product, and [/or] at least one of a minimum value or a maximum value of a relation of one or more of the determined excited boron-releasing gas products to another glow discharge product [are maintained] to produce a boride layer.

2. (Amended) A method according to claim 1, wherein [for producing a boride layer on a surface by plasma boronizing comprising supplying a gas mixture containing a boron-releasing gas to a reactor; and] said step of generating the glow discharge in the reactor comprises using a pulsed DC voltage source having a ratio of voltage pulse duration to subsequent pulse pause duration which is greater than 1.1:1.

3. (Amended) A method according to claim 1 wherein [for producing a boride layer on a surface by plasma boronizing comprising supplying a gas mixture containing a boron-releasing gas to a reactor; and] said step of generating [a] the glow discharge in the reactor comprises [by] applying a DC voltage in pulses having a pulse period of less than 230 μs.

4. (Amended) A method according to claim 1, further comprising [for producing a boride layer on a surface by plasma boronizing comprising]:

[supplying a gas mixture containing a boron-releasing gas to a reactor; and]

generating a glow discharge in the reactor while maintaining the gas mixture at a selected [low] treatment temperature during a first stage to first produce [a] said [relatively thin, dense] boride layer and prevent formation of halogenides which cause formation of pores, and maintaining the gas mixture at a higher temperature than a previous temperature during in a second stage.

7. (Amended) A method according to claim 1 wherein the method includes a first stage during which the gas mixture is maintained at a selected [low] temperature to prevent formation of halogenides which cause formation of pores to first produce [a] said [relatively thin, dense] boride layer, followed by a second stage during which the gas mixture is maintained at a higher temperature.

9. (Amended) A method according to claim 2 wherein the method includes a first stage during which the gas mixture is maintained at a selected [low] temperature

to prevent formation of halogenides which cause formation of pores to first produce [a] said [relatively thin, dense] boride layer, followed by a second stage during which the gas mixture is maintained at a higher temperature.

10. (Amended) A method according to claim 3 wherein the method includes a first stage during which the gas mixture is maintained at a selected [low] temperature to prevent formation of halogenides which cause formation of pores to first produce [a] said [relatively thin, dense] boride layer followed by a second stage during which the gas mixture is maintained at a higher temperature.

11. (Amended) A method according to claim 1 [2 or claim 5] including determining the amount of the excited boron-releasing gas in the reactor at least in a relative manner.

14. (Amended) A method according to claim 13 wherein, in order to form one of [a] the minimum value and the [or] maximum value of the excited boron-releasing gas content, the determined amount of the excited boron-releasing gas is set in relation to a determined amount of at least one further boron-releasing gas product.

15. (Amended) A method according to [any one of] claim[s] 1 [-4] wherein [a] said supplied gas mixture [is supplied which contains] comprises [a] boron trihalide as [a] the boron-releasing gas product in a concentration greater than about 1% by volume, along with hydrogen gas and, optionally, a noble gas.

16. (Amended) A method according to [any one of] claim[s] [1-] 4 wherein the glow discharge is generated by applying a pulsed DC voltage which has a ratio of the voltage pulse duration to the subsequent pulse pause duration in the range from about 1.1:1 to 5:1 ratio.

18. (Amended) A method according to [any one of] claim[s] [1-] 4 [wherein] further comprising generating the glow discharge using a pulsed DC voltage having a pulse period of less than about 210 µs [is used for generating the glow discharge].

21. (Amended) A method according to claim 20 wherein the pulsed DC voltage is in the range between about 650 volts and about 800 volts.

22. (Amended) A method according to [any one of] claim[s] 1 [-4] wherein the reactor pressure is maintained in a [low-]pressure range between about 0.5 and about 15 hPa.

24. (Amended) A method according to [any one of] claim[s] 1 [-4] wherein the gas mixture contains a boron trihalide in a concentration of between 2% by volume and about 50% by volume.

26. (Amended) A method according to [any one of] claim[s] 1 [-4] wherein the gas mixture contains up to 20% by volume of a noble gas and 2% by volume to 50% by volume of boron trihalide, the remainder being hydrogen gas.

29. (Amended) A method according to [any one of] claim[s] 1 [-4] wherein the boron-releasing gas is one of BCl_3, BF_3 and mixtures thereof.